

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-13. Cancelled.

14. (Currently Amended) A liquid chromatography sample injection system comprising:

- (a) a probe drive system of an automated liquid handler wherein the probe drive system comprises an arm and a probe;
- (b) an injector valve mounted on the arm of the probe drive system;
- (c) a conduit, wherein the conduit directly connects the injector valve and the probe;

and

- (d) a pump valve interfacing with the injector valve and a probe pump and a source of dilutant;

wherein the pump valve is movable between a first position where the probe pump is operable to dispense and aspirate through the probe, and a second position where the probe pump communicates with the source of dilutant for rinsing the probe.

15-18. Cancelled.

19. (Previously Presented) The liquid chromatography sample injection system of claim 14 further comprising:

- (d) a sample analyzer connected to the injector valve.

20. (Previously Presented) The liquid chromatography sample injection system of claim 19 further comprising

- (e) a source of mobile phase, wherein the source of mobile phase is connected to the injector valve.

21. (Previously Presented) The liquid chromatography sample injection system of claim 20 wherein the source of mobile phase comprises a pressurized liquid phase.
22. (Previously Presented) The liquid chromatography sample injection system of claim 21 wherein a high pressure pump supplies the source of mobile phase to the injector valve.
23. (Previously Presented) The liquid chromatography sample injection system of claim 14 wherein the sample analyzer comprises a liquid chromatography column.
24. (Previously Presented) The liquid chromatography sample injection system of claim 23 wherein the sample analyzer further comprises a detector.
25. (Previously Presented) The liquid chromatography sample injection system of claim 24 wherein the detector comprises an ion detector or a mass spectrometer.
26. (Currently Amended) The liquid chromatography sample injection system of claim 14 ~~wherein the pump valve comprises a three-way valve further comprising a probe pump wherein the probe pump provides pressure to dispense and aspirate through the probe.~~
27. (Previously Presented) The liquid chromatography sample injection system of claim 14 wherein the probe drive system comprises an X arm extending horizontally in an X direction; a Y arm slidably mounted on the X arm wherein the Y arm extends horizontally in a Y direction; and a Z arm slidably mounted on the Y arm wherein the Z arm extends vertically in a Z direction.
28. (Previously Presented) The liquid chromatography sample injection system of claim 27 wherein the injector valve is mounted on the Z arm of the probe drive system.
29. (Previously Presented) The liquid chromatography sample injection system of claim 14 wherein the injector valve is located within about 6 inches of a vertical axis of the probe.
30. (Previously Presented) The liquid chromatography sample injection system of claim 14 wherein the conduit has a length of less than 12 inches.

31. (Previously Presented) The liquid chromatography sample injection system of claim 14 wherein the injector valve alternates between a sample loading position and a sample injection position.

32. (Previously Presented) The liquid chromatography sample injection system of claim 31 wherein an injection valve interface control module controls the alternation of the injector valve and a motor powers the alternation of the injector valve.

33. (Previously Presented) The liquid chromatography sample injection system of claim 14 wherein the injector valve is a six port injection valve.

34. (Previously Presented) The liquid chromatography sample injection system of claim 14 wherein the injector valve is a four port injector valve.

35. (Currently Amended) The liquid chromatography sample injection system of claim 14 ~~further comprising a~~ wherein the probe pump is operable to receive source of dilutant when the pump valve is the second position and is operable to deliver the dilutant to the probe when the pump valve is in the first position.

36. (Previously Presented) The liquid chromatography sample injection system of claim 14 further comprising a controller, wherein the controller operates the probe drive system.

37. (Currently Amended) A liquid chromatography sample injection system comprising:

(a) a probe drive system of an automated liquid handler; wherein the probe drive system comprises an X arm extending horizontally in an X direction; a Y arm slidably mounted on the X arm wherein the Y arm extends horizontally in a Y direction; and a Z arm slidably mounted on the Y arm wherein the Z arm extends vertically in a Z direction; and a probe holder slidably mounted on the Z arm a probe and an arm;

(b) an injector valve mounted on the Z arm of the probe drive system; wherein the injector valve comprises a sample loop, a probe port, a mobile phase input port, a column output port and a probe pump port;

- (c) a probe directly connected to the probe port and the probe holder;
- (d) a sample analyzer connected to the column output port;
- (e) a probe pump connected to the probe pump port; and
- (f) a source of pressurized mobile phase connected to the mobile phase input port.

38. (Currently Amended) A method of injecting a sample into a sample analyzer of a liquid chromatography sample injection system comprising:

- (a) placing an injection valve into a sample loading position, wherein the injection valve is mounted on an arm of a probe drive system of an automated liquid handler;
- (b) operating a pump to provide a negative pressure through a pump valve for aspirating a liquid sample through a probe of the probe drive system and into the injection valve;
- (c) placing the injection valve into a sample injection position;
- (d) entraining the liquid sample in the injection valve by addition of a mobile phase;
and
- (e) operating the pump to provide a positive pressure through the pump valve for injecting the entrained liquid sample into a sample analyzer; and
- (f) rinsing the probe by operating the pump to deliver a solvent through the pump valve and the injection valve to the probe.